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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/903,028	07/11/2001	Nuggehally S. Jayant	07816.105003	9832
30827	7590	02/07/2005	EXAMINER	
MCKENNA LONG & ALDRIDGE LLP			ROSARIO, DENNIS	
1900 K STREET, NW			ART UNIT	
WASHINGTON, DC 20006			PAPER NUMBER	
			2621	

DATE MAILED: 02/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/903,028

Applicant(s)

JAYANT ET AL.

Examiner

Dennis Rosario-Vasquez

Art Unit

2621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on Amt. 18 August 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 18-20 is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 July 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

1. The amendment was entered on August 18, 2004. Claims 1-20 are pending.

### ***Specification***

2. The disclosure is objected to because of the following informalities:

Page 1, line 15 and 18 need an updated status/numbers of each respective application.

Appropriate correction is required.

### ***Claim Objections***

3. Due to the amendment, the objection to claim 4 is withdrawn.

### ***Response to Arguments***

4. Applicant's arguments filed August 18, 2004 on pages 7 and 8 with respect to claims 1,9 and 10 have been fully considered but they are not persuasive.

The amendment states on page 8, lines 1,2," However, nowhere in Bolle is there any disclosure or suggestion of associating the subject portion/block with a third intensity as claimed."

However, Bolle et al. does disclose associating the subject portion/block (Using figure 10, foreground 1030 of a fingerprint has foreground blocks or squares along the line of 1030 as the subject portion.) with a third intensity (An intensity value, " $(\mu)$ ", of each foreground "block" 1010 in col. 10, lines 2-4 is determined. Thus, the intensity value,  $(\mu)$ , is associated with a block along line 1030 or subject portion of fig. 10.).

5. Applicant's arguments filed August 18, 2004 on page 12 with respect to claim 12 have been fully considered but they are not persuasive.

The amendment states on page 9, lines 8 and 9," More specifically, the combination of Bolle and Cox fails to disclose or suggest an edge enhancer as claimed."

However, Bolle et al. does suggest an edge enhancer in col. 2, lines 9-11 for "enhancement" in col. 2, line 10 of features that are extracted and shown in figure 8,num. 820: FOREGROUND EXTRACTION.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1,2,3,4,5,6,7,8,11 are rejected under 35 U.S.C. 102(b) as being anticipated by Bolle et al. (US Patent 5,883,971 A).

Regarding claim 1, Bolle et al. discloses a method (Figs. 8, 8A and 8B) for processing an image (Fig. 10 is an image of a fingerprint.), comprising the steps of:

Art Unit: 2621

a) comparing (Fig. 8A, num. 823 is a pixel of interest intensity comparing step with the pixel of interest depicted as "(i, j)" and shown in figure 9.) a first image intensity (Fig. 10, num. 1030 and the enclosing area of 1030 is the foreground or first image intensity.) associated with a subject image portion (Using figure 10, foreground 1030 of a fingerprint.) with a second image intensity (Fig 10, num. 1050 is the background or second intensity.) associated with an adjacent image (Fig. 10, num. 1050 is adjacent to numeral 1030 which encloses an area that includes numerals 1010, 1015, 1020, 1040, 1045 and 1060.);

b) determining an image intensity difference (Fig. 8A, num. 824 is a sum of differences between each direction of intensity pixels of figure 9.) between the first image intensity (Fig. 10, num. 1030 and the enclosing area of 1030 is the foreground or first image intensity.) and the second image intensity (Fig 10, num. 1050 is the background or second intensity.).

Art Unit: 2621

c) classifying (Fig. 8B, num. 884 classifies all intensity values within each block or square of figure 10 as either "SMUDGED BLOCK" or "NON-SMUDGED BLOCK".) the subject image portion (Using figure 10, foreground 1030 of a fingerprint.) as a candidate edge portion (In a previous step 882 of figure 8B the ridges of the fingerprint or edges are computed or "judged" in col. 3, lines 37-45 within the foreground at col. 10, line 1-6 and further elaborated at col. 3, lines 46-57.) in response to a determination (Fig. 8B, num. 882 is a previous determination step.) that the first image intensity is less than the second image intensity (Using figure 8B, Bolle et al. states, "For each block [step 882 of figure 8, num. 882: COMPUTE  $\mu$  AND  $\sigma$ ] next computes the mean intensity ( $\mu$ ) of pixels whose intensities are smaller than the mean intensity of all pixels within the block. (The pixels whose intensities are smaller than the mean intensity of all pixels in the block are considered to be pixels on a ridge, i.e., ridge pixels (col. 10, lines 1-6).), and

d) a determination (Fig. 8A, num. 824:  $\Sigma(\text{differences}) > \text{BACKGROUND THRESHOLD}$ .) that the image intensity difference (figure 8A, num. 824, label: " $\Sigma(\text{differences})$ ") is greater (figure 8A, num. 824, label: ">") than a predetermined threshold image intensity difference (figure 8A, num. 824, label: "BACKGROUND THRESHOLD" is a predetermined threshold intensity difference in col. 7, lines 20-22.);

e) determining (fig. 8B, num. 887 determines whether a smudged fingerprint or a non-smudged fingerprint is present.) whether the candidate edge portion (In a previous step 882 of figure 8B the ridges of the fingerprint or edges are computed or “judged” in col. 3, lines 37 45 within the foreground at col. 10, line 1-6 and further elaborated at col. 3, lines 46-57.) is a true edge portion (Thus, the smudged fingerprint represents a false fingerprint which needs to be processed again to produce a true non-smudged fingerprint.); and

f) associating the subject image portion (Using figure 10, foreground 1030 of a fingerprint has foreground blocks or squares along the line of 1030 as the subject portion. Note that a block is shown labeled as 1020 in fig. 10.) with a third image intensity , wherein the third image intensity (A “mean intensity ( $\mu$ )” in col. 10, line 2, of each foreground square or “block” in col. 10, lines 2-4 is determined. Thus, the intensity value, ( $\mu$ ), is associated with block or subject portion of fig. 10.) is less (Intensity value “ $\mu$ ” is less or “smaller” in col. 10, line 3 than a “mean intensity” in col. 9, line 67 to col. 10, line 1 of “fore[ ]ground block[s]” in col. 9, line 67 to col. 10, line 1.) than the first image intensity (Fig. 10, num. 1030 contains “foreground block[s]” in col. 9, line 67 to col. 10, line 1 that contain the first “mean intensity” in col. 9, line 67 of the image.).

Regarding claim 2, Bolle et al. discloses the method of claim 1, wherein the step of determining whether the candidate edge portion is a true edge portion, comprises the step of determining whether the candidate edge portion (Fig. 10, num. 1030 is the foreground area or candidate edge portion that comprises additional area 1010 within the area of 1030. Each area of 1010 has a direction that corresponds to a ridge of a finger print or an edge as depicted as numeral 1040 of figure 10.) is adjacent to at least one second candidate edge portion (Thus, an area of 1010 contains ridges or edges of a fingerprint contained within each block or square.)

Claims 3 and 4 are rejected the same as claim 2. Thus, argument similar to that presented above for claim 2 is equally applicable to claims 3 and 4.

Regarding claim 5, Bolle et al. discloses the method of claim 1, wherein the image is a digitized image (Bolle et al. uses a scanner fig.7, num. 765 converts analog signals to digital).

Regarding claim 6, Bolle et al. discloses the method of claim 5, wherein the image subject portion is a pixel (Each square or block of figure 10 contains an array of pixels as shown in figure 9 which determines the orientation of each pixel in the block , fig. 8A, num. 822, for the entire image.).

Regarding claim 7, Bolle et al. discloses the method of claim 5, wherein the adjacent image portion is a pixel (Claim 7 has been addressed in claim 6).



Regarding claim 8, Bolle et al. discloses the method of claim 5, wherein the image is a frame (Fig. 7, num. 750 is a frame grabber that capture a frame) of a video stream (Fig. 7, num. 760 is a camera which provides frames to the framegrabber 750. Note that the framegrabber captures multiple frames or captures video.).

Claims 11 is rejected the same as claim 8. Thus, argument similar to that presented above for claim 8 is equally applicable to claim 11.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bolle et al. (US Patent 5,883,971 A) in view of Sojourner (US Patent 6,473,092 B1).

Regarding claim 9, Bolle et al. does not teach intensity measures in luminance and chrominance, but Bolle et al. does suggest "lighting" during "image acquisition" in col. 2, lines 35,36 and "illumination" during image acquisition in col. 2, line 53.

However, Sojourner, in the field of endeavor of illumination of displays, does teach the image intensity that is measured in luminance (Sojourner teaches that a pixel illuminated by a light source) and chrominance (The illuminated pixel produces a luminance value and chrominance or color value (col. 3, lines 26-31) that can be combined with other chrominance values to produce a single intensity (col. 3, lines 35-

21).).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify image acquisition teaching that uses intensity of Bolle et al. using the teaching of Sojourner's intensity teaching, because Sojourner's intensity teaching "renders images in a way optimized for perception by the human visual system (as in the identification of finger prints as taught by Bolle et al.). This allows improved image color quality and a reduction in device complexity (Sojourner, col. 3, lines 40-43)."

Claim 10 is rejected the same as claim 9. Thus, argument similar to that presented above for claim 9 is equally applicable to claim 10.

9. Claims 12,13,14,15,16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bolle et al. (US Patent 5,883,971 A) in view of Cox, Jr. et al (US Patent 5,237,316 A).

Regarding claim 12, Bolle et al. teaches a system (fig. 7) for enhancing ("enhancement" in col. 2, line 10 of features that are extracted using figure 8, num. 820: FOREGROUND EXTRACTION.) a digitized image (fig. 7, num. 735 is a digitized image.), comprising:

a) a post-processing unit (fig. 8, num. 850:POSTPROCESSING) operative to filter ("remove" in col. 8, line 18) the digitized image (fig. 7, num. 735 is a digitized image.) to process an image flaw ("noise" in col. 8, lines 17-19);

b) an edge enhancer (figure 8,num. 820: FOREGROUND EXTRACTION enhances features in col. 2, line 10.) operative to detect an edge (The enhanced feature of fig. 8,num. 820 are outputted to fig. 8, num. 830:ORIENTATION COMPUTATION that detects the orientation or edge of pixels.) in the digitized image (fig. 7, num. 735 is a digitized image.) and to enhance the edge ("enhancement" in col. 2, line 10 of features that are extracted using figure 8,num. 820: FOREGROUND EXTRACTION.) in the digitized image (fig. 7, num. 735 is a digitized image.).

Bolle et al. does not suggest a decoder, but does suggest transmitting/receiving data in fig. 7, num. 730) over a NETWORK as shown in figure 7, num. 786.

However, Cox, Jr. et al., in the field of endeavor of image compression with intensity, teaches a decoder of claim 12:

A decoder (Cox, Jr. et al., fig. 1, num. 50) operative to receive an encoded fig. 1 , num. 30) digitized image (fig. 1, num. 24) and to expand (fig. 1 , num 22: "RECONSTRUCTION") the encoded digitized image to generate a decoded digitized image (Fig. 1, num. 26: IMAGE DISPLAYED).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Bolle et al.'s transmission of data over a network with Cox, Jr et al.'s encoder 30 and decoder 50 and figure 1, label: "STORAGE AND TRANSMISSION" teaching, because Cox, Jr et al.'s encoder 30, decoder 56 and figure 1, label: "STORAGE AND TRANSMISSION" teaching provides images constructed of pixels with 12-bit intensity values may be compressed into 8-bit bytes of differential data for storage or transmission and then decoded at rates sufficient to support flicker-free

Art Unit: 2621

display of an image having a frame size of 1024X1024 pixels (Cox, Jr. et al., col. 3, lines 40-45)."

Claim 13 is rejected the same as claim 1. Thus, argument similar to that presented above for claim 1 is equally applicable to claim 13.

Claim 14 is rejected the same as claim 4. Thus, argument similar to that presented above for claim 4 is equally applicable to claim 14.

Claims 15 is rejected the same as claims 1 and 2. Thus, arguments similar to that presented above for claims 1 and 2 are equally applicable to claim 15.

Regarding claim 16, Bolle et al. teaches the system of claim 12, wherein the post-processor (fig. 8, num. 850:POSTPROCESSING) removes ("remove" in col. 8, line 18) the image flaw ("noise" in col. 8, lines 17-19) from the decoded digitized image (fig. 7, num. 735 is a digitized image.), in response to a determination that an image intensity (A "directional block" in col. 8, line 24 is used to determine the direction of the directional block using fig. 9 that uses intensity.) of a pixel (Fig. 9 has a central pixel and is used with the directional blocks to determine the direction of the directional block.) associated with the image flaw ("noise from...blocks" in col. 8, lines 17-19.) does not differ (The directional block is "inconsistent" in col. 8, line 22 or consistent or does not differ with other directional blocks.) from at least one surrounding pixel ("inconsistent with their neighbor[ing]" blocks in col., lines 21,22. Note that fig. 9 is used to determine the direction of the blocks that are inconsistent or consistent or does not differ with their neighbors.) by more than a threshold value (If a block is consistent and is surrounded by inconsistent blocks, then the block that was consistent is changed to a inconsistent

block in col. 8, lines 21-26. Thus, the threshold value is at least two surrounding blocks are required to change a third neighboring block to either consistent or inconsistent.).

Regarding claim 17, Herman et al. teaches the system of claim 12, wherein the post-processor (fig. 8, num. 850:POSTPROCESSING) adjusts ("reabeled" in col. 8, line 24) the image flaw ("noise from...blocks" in col. 8, lines 17-19 are used for labeling.) in the decoded digitized image (fig. 7, num. 735 is a digitized image.), by modifying an image intensity (A block is "reabeled" in col. 8, line 25 and the labeling corresponds to a block that contains pixel directions, labeled as "1" or not, labeled as "0" in col. 8, lines 10-15. Thus, if a block is relabeled, then the pixel direction is modified.) of a pixel associated with the image flaw ("noise from...blocks" in col. 8, lines 17-19 are used labeling.) to correspond to a median image intensity value (A middle or central block in an "matrix of blocks" in col. 8, line 37.) of at least one surrounding pixel (A block that surrounds the central block. Note, that each block contains pixels in col. 8, lines 2,3.).

#### ***Allowable Subject Matter***

10. Claims 18-20 are allowed.

11. The following is a statement of reasons for the indication of allowable subject matter:

Claim 18 has the limitation of "classifying the first pixel as a true edge pixel in response to a determination that the first pixel is adjacent to the second candidate edge pixel and the second candidate edge pixel is adjacent to the third candidate edge pixel". This feature is not disclosed or suggested in the prior art.

The closest prior art teaches, Le (US Patent 6,608,942 B1), teaches that a candidate edge pixel is classified as a candidate edge pixel in response to a series of comparisons of other pixels to a threshold using table 7 in column 21. Once a pixel is classified as a candidate pixel or "target pixel" of fig. 20, other candidate pixels are determined to be adjacent to the classified candidate pixel or "target pixel" of fig. 20 as described in col. 24, line 50 to col. 25, line 14.

Therefore the difference between the claimed invention and the Le reference is that the classification of Le classifies according to pixels that are not classified as candidate edge pixels and is not based on adjacency, and the claimed invention classifies according to pixels that are already classified as candidate edge pixels and adjacency.

### ***Conclusion***

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Art Unit: 2621

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Rosario-Vasquez whose telephone number is 703-305-5431. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Boudreau can be reached on 703-305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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**DANIEL MIRIAM**  
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